ORDER

1320.58

EQUIPMENT AND FACILITY DIRECTIVES—MODIFICATION AND MAINTENANCE TECHNICAL HANDBOOKS

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RECORD OF CHANGES

DIRECTIVE NO. 1320.58

CHANGE TO BASIC	SUPPLEMENT			OPTIONAL	CHANGE TO BASIC	SUPPLEMENTS			OPTIONAL

FOREWORD

This order revises, updates, and consolidates the general administrative and procedural standards that establish guidance to personnel in preparing maintenance directives for electronic and electro/mechanical systems in the National Airspace System (NAS). It also recasts responsibilities and procedures with current organizational changes.

The material in this order provides directions for the preparation of Operational Support Service (AOS) equipment and facility directives, specifically maintenance technical handbooks and modifications.

Charles L. Stith
Director, Operational Support Service

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CHAPTER 1. GENERAL

100. PURPOSE. This order establishes and describes the equipment and facility directives that the Operational Support Service (AOS) is responsible for. This order is also the primary means of preparing equipment modification directives and maintenance technical handbooks.

101. DISTRIBUTION. This order is distributed to branch level in the System Management Service, the NAS Transition and Implementation Service, the Operational Support Service, and the Associate Administrator for NAS Development; to branch level in the regional Airway Facilities divisions; to division level in the Associate Administrator for Airway Facilities, the FAA Logistics Center, the regional Logistics Divisions, and the Academy; and to all Airway Facilities field offices with a limited distribution.

102. CANCELLATIONS. The following orders are cancelled:

a. Order 1320.33B, Equipment Modification and Facility Instruction Directives.

b. Order 1320.35A, Preparation of Airway Facilities Service Maintenance Technical Handbooks.

c. Order 1320.40B, Expedited Clearance Procedures for Airway Facilities Maintenance Directives.

103. BACKGROUND. In a continuing effort to improve maintenance technical handbooks and equipment modification directives, AOS has revised, updated, and combined a specific group of orders related to the preparation of, and responsibilities for, maintenance and modification directives.

104. DEFINITIONS. The following acronyms and terms are used in this directive.

a. AAF. Associate Administrator for Airway Facilities

b. EEM. Electronic Equipment Modification

c. EFI. Electronic Facility Instruction

d. GPO. Government Printing Office

e. Handbook. The term HANDBOOK refers to maintenance technical and/or electronic equipment modification directives.

f. Initiating Office. An office internal to the office of primary responsibility (OPR). This term encompasses project engineers, program managers, item managers, or any other AAF/AOS personnel responsible for issuing the handbook.

g. NCP. National Airspace Change Proposal

h. NSED. National Systems Engineering Division

i. Office of Primary Responsibility (OPR). The office responsible for the specified technical program with respect to the procurement of the equipment and associated instruction book manuscripts.

j. PEM. Plant Equipment Modification

k. PFI. Plant Facility Instruction

105. FORMS. Refer to Appendix 1, DOT/FAA Forms Listing, for a list of forms and their availability. Examples of forms required to issue a handbook as a directive can be found in the latest version of FAA Order 1320.1, FAA Directives System.

106. REVIEW/UPDATE OF MAINTENANCE DIRECTIVES. AOS will review/update all maintenance directives every 3 years. This review will include maintenance technical handbooks. Also, since maintenance technical handbooks are baselined, changes can only be effected through the NCP process. All data pertaining to standards, tolerances, maintenance schedules, certification, etc., contained in the maintenance technical handbooks take precedence over those contained in instruction books if different.

107. SCOPE. The information contained herein is applicable to AOS technical directives only, and in no way alters, supersedes or cancels the general standards governing the organization, preparation, and revision of directives as contained in Order 1320.1.

108.-199. RESERVED.

CHAPTER 2. PREPARATION OF MAINTENANCE TECHNICAL HANDBOOKS

SECTION 1. GENERAL

200. OBJECTIVE. This chapter provides detailed guidance to personnel preparing maintenance technical handbooks. It also contains administrative and technical information on guidelines, procedures, standards, and instructions for preparing AOS technical handbooks.

201. HANDBOOK MANUSCRIPTS. Manuscripts for maintenance technical handbooks will normally be prepared by NSED personnel (AOS-200/300/400/500). Technical documentation within the scope of this chapter may be produced by other organizations on assignment, such as a selected regional office, or, in special cases, by contractors.

202. MAINTENANCE SOURCE DATA AND COORDINATION.

a. Source Data. Maintenance technical handbooks depend on the experience and knowledge of AOS engineering and program management personnel for their technical accuracy, suitability, and completeness. Information solicited from regional office and field technical personnel is of great value when writing maintenance technical documentation. Both formal and informal methods have been approved for obtaining such support in the maintenance documentation activity, and the documentation engineer is expected to take the initiative to draw expeditiously on the sources available. It is the engineer's responsibility to see that any existing EFI/PFI are included in the maintenance technical handbook (see par. 300e).

b. Coordination. Almost all maintenance technical documentation contains technical and procedural information or guidance that interests or affects the business, program, or functions of other independent organizational activities. Therefore, those organizations must be consulted at an early stage in the planning and preparation of the material (see Appendix 2, Sample Notice of Intent to Publish a Major Handbook Revision). Consequently, the concept of early coordination and participation in providing source data by field personnel is mandatory. This process includes expediting the clearance of new or revised maintenance technical handbooks and providing direct input to maintenance technical handbooks from the user level. The NSED will announce, by notice, the intent to publish a new maintenance handbook or a major revision of an existing handbook. The notice will be distributed to all Airway Facilities field offices (FAF-0 distribution code) and other selected offices requesting input to the handbook. The notice will request Airway Facilities sector offices to collect handbook recommendations and submit them to the regional Airway Facilities divisions for consolidation and transmittal to the NSED. Submission dates will be adjusted to accommodate the complexity of the subject and the desired publication date for the handbook. At least 60 days will be allowed for Airway Facilities sector offices to submit recommendations to regional Airway Facilities divisions, and an additional 30 days will be allowed for the regional Airway Facilities divisions to collect, consolidate, and provide input to the NSED.

NOTE: The 90 days cited include ALL mail delays, etc. Based on information on hand, plus that furnished by the regions, the handbook will be prepared and issued with no further clearance by the regions.

(1) Critical Changes. Changes involving extremely critical operational matters, or those involving safety will be issued by the fastest available manner. Such changes will normally be made by General Notice (GENOT), notices, or a minimal scope handbook, and followed by appropriate permanent documentation or a full-format handbook.

(2) Sample Notice. A sample notice of intent to publish a major handbook revision is included as appendix 2. This notice should be used to advise concerned offices of the intent to revise a technical handbook. The standard paragraphs given are to be included in each notice. The originating office may include additional paragraphs or append explanatory or background material that will assist recipients in preparing their recommendations.

203. DISTRIBUTION. Maintenance Technical handbooks are distributed under the subject/category item numbers indicated by the latest edition of FAA Order 1720.30, Distribution of Systems Maintenance Service Technical Directives Affecting Airway Facilities.

204.-205. RESERVED.

SECTION 2. GENERAL REQUIREMENTS

206. GENERAL.

a. Organization. As a general rule, the maintenance handbook organization specified in paragraph 207 is directly applicable to electronic and electro/mechanical equipment and system handbooks. These handbooks shall utilize the chapter, paragraph, and subparagraph titles shown, with the exception that a chapter for flight inspection will not be required in handbooks where there is no requirement for flight inspection. There may be occasions when the handbook organization shown will have to be modified to meet individual subject requirements. Additional major topics may be added, as necessary. Certain non-equipment handbooks (such as maintenance of roads, grounds, structures and buildings, painting, etc.) are exempt from the above requirements; however, the organization should be followed to the extent practicable. In all instances, however, the handbook material shall be compatible with the latest edition of FAA Order 6000.15, General Maintenance Handbook for Airway Facilities.

b. Content. Handbooks shall be thorough and presented in a manner which ensures their usefulness to the field technicians. Handbooks should provide system-oriented information (which ties together the various units and/or components that make up a system or equipment) not available in instruction books. Handbooks shall not contain equipment modification instructions, but the information therein shall reflect the equipment configuration which results from the accomplishment of all approved modifications. Indiscriminate duplication of information contained in instruction books is not desirable and should be avoided. The handbooks will not replace instruction books, but will

generally supplement and augment information contained in these books. Installation instructions are usually contained in separate standard equipment installation handbooks.

207. BASIC ORGANIZATION OF A MAINTENANCE TECHNICAL HANDBOOK. A standardized organization will permit the user to quickly find and refer to any information desired and to become familiar with information contained in the handbook. It also simplifies and expedites the preparation of the final handbook. The following basic organization shall be used when preparing maintenance technical handbooks:

a. Cover. Use FAA Form 1320-2, Order Cover Format, to prepare the cover. Use of the word HANDBOOK in the title is permitted.

b. Record of Changes. FAA Form 1320-5, Record of Changes, is printed on the reverse side of the cover. The record of changes is used to record all the printed changes to the order or handbook.

c. Foreword. A foreword signed by the Director, Operational Support Service, shall be prepared for each handbook.

d. Table of Contents. A table of contents shall be prepared for each handbook.

e. List of Tables.

f. List of Illustrations.

NOTE: Table of Contents, List of Tables, and List of Illustrations may be combined in short, non-complex directives.

g. Chapter 1. General Information and Requirements. This chapter shall contain existing general guidance regarding the subject of the handbook.

h. Chapter 2. Technical Characteristics. This chapter shall contain the purpose or function, description, and theory of the system or equipment.

i. Chapter 3. Standards and Tolerances. This chapter shall contain the prescribed standards and tolerances for the applicable system or equipment.

j. Chapter 4. Periodic Maintenance. This chapter shall contain a list of essential maintenance activities which are required on a periodic, recurring basis and the schedules for their accomplishment.

k. Chapter 5. Maintenance Procedures. This chapter shall contain the procedures which are required for accomplishing the various maintenance activities, both preventive and corrective, and any associated safety precautions.

l. Chapter 6. Flight Inspection. This chapter shall contain the ground procedures to be followed in connection with flight inspections.

m. Chapter 7. Miscellaneous. This chapter shall contain miscellaneous instructions and information not suitable for inclusion in other chapters.

NOTE: An index and glossary may be appropriate for certain handbooks. The office preparing the handbook is responsible for determining the need for these. If appropriate, include as an appendix.

208.-215. RESERVED.

SECTION 3. DETAILED REQUIREMENTS

216. HANDBOOK FORMAT AND CONTENT. The requirements and instructions as specified in Order 1320.1 and in the subparagraphs below shall be followed when preparing maintenance technical handbooks. Number and heading of chapters, sections, and paragraphs shall be in accordance with Order 1320.1 and the following subparagraphs.

a. Foreword. The foreword shall be prepared as described below:

(1) Purpose. This handbook provides guidance and prescribes technical standards, tolerances, and procedures applicable to the maintenance and inspection of (Specify). It also provides information on special methods and techniques which will enable maintenance personnel to achieve optimum performance from the equipment. This information augments information available in instruction books and other handbooks, and complements the latest edition of FAA Order 6000.15, General Maintenance Handbook for Airway Facilities.

NOTE: The text of the paragraph titled PURPOSE shall be the same for all handbooks, with the exception that the appropriate system or equipment type shall be inserted in the blank.

(2) Distribution. The second mandatory paragraph of the foreword shall be titled and worded (for most AOS maintenance technical handbooks) as follows:

DISTRIBUTION. This directive is distributed to selected offices and services within Washington headquarters, the FAA Technical Center, the Mike Monroney Aeronautical Center, regional Airway Facilities divisions, and Airway Facilities field offices having the following facilities/equipment:

_____

(3) Cancellation. This paragraph is used in the foreword only when the handbook totally supersedes and cancels another directive.

(4) Explanation of Changes. This paragraph shall be used if a cancellation occurs, thereby creating a need to explain the differences between the old and new version.

(5) Maintenance and Modification Procedure. This is a mandatory paragraph when the handbook concerns AOS maintained equipment, systems, or facilities where AOS provides second level engineering support. It shall take the next available number and be titled and worded as follows:

(a) The Order 6000.15, this handbook, the applicable equipment instruction book, and other applicable handbooks shall be consulted and used together by the maintenance technician in all duties and activities for the maintenance of (Specify). The three documents shall be considered collectively as the single

official source of maintenance policy and direction authorized by the Operational Support Service. References located in the appropriate paragraphs of this handbook entitled Chapter 3, Standards and Tolerances, Chapter 4, Periodic Maintenance, and Chapter 5, Maintenance Procedures, shall indicate to the user whether this handbook and/or the equipment instruction book shall be consulted for a particular standard, key inspection element or performance parameter, performance check, maintenance task, or maintenance procedure.

(b) The latest edition of FAA Order 6032.1, Modification to Ground Facilities, Systems, and Equipment in the National Airspace System, contains comprehensive direction concerning the development, authorization, implementation, and recording of modifications to facilities, systems, and equipment in commissioned status. It supersedes all instructions published in earlier editions of maintenance technical handbooks and related directives.

(6) Forms Listing. This paragraph is used in the foreword only when a form unique to the maintenance or inspection of the particular equipment, system, or facility is required. Examples of unique, required forms are: FAA Form 6000-8, Technical Performance Record, FAA Form 6790-4, VOR Ground Check Record, and FAA Form 6670-1, Multi-Channel Recorder Check Record. Forms of general usage, such as FAA Form 6030-1, Facility Maintenance Log, FAA Form 6030-16, Technical Reference Data Records Cover/Transmittal Sheet, and FAA Form 6030-17, Technical Reference Data Record, found in the latest editions of Orders 6000.15, 6032.1, and other supporting directives, are not listed in the foreword, although they may be referred to, when appropriate, in the handbook text.

(7) Recommendations for Improvement. This paragraph shall be used when soliciting recommendations for improvement. Tear out comment sheets shall be provided in back of the handbook. Recommendations for improvement for maintenance handbooks and configuration control shall be submitted by a NCP.

(8) Signature of Director, Operational Support Service. Each foreword is signed by the Director, Operational Support Service.

b. Table of Contents. The table of contents shall be prepared in accordance with paragraph 608 of Order 1320.1. If the handbook is large and complex, it is permissible (and may even be desirable) to segregate the lists of tables and illustrations from the chapter, section, and paragraph listing in the table of contents.

c. Chapter 1. General Information and Requirements.

(1) Subject Matter. This chapter shall be made a part of each handbook. It shall contain information pertaining to the equipment, system, or facility as a whole, and to the use of the handbook itself. While giving general information and guidance on the subject, it should not duplicate information contained in Order 6000.15 or Order 6032.1, or in the other chapters of the handbook. Where required for completeness, additional information regarding the subject matter of Order 6000.15, but applicable only to the system or equipment covered by the maintenance technical handbook, shall be shown as a topic with its own paragraph heading and may be subdivided into subparagraphs, as required.

(2) First Paragraph. The first paragraph of this chapter shall be titled and worded as follows:

OBJECTIVE. This handbook provides the necessary guidance, to be used in conjunction with information available in instruction books and other handbooks, for the proper maintenance of ___(Specify)___.

(3) Certification. A certification paragraph, if required, shall be titled and worded as follows:

CERTIFICATION. Refer to Order 6000.15 for general guidance on the certification of systems, subsystems, and equipment. Refer to appendix 1 of this handbook for the specific certification requirements of the (Specify) _____ system.

(4) Aircraft Accident. A paragraph entitled Aircraft Accident shall be included in this chapter for handbooks pertaining to facilities, systems, or equipment directly involved in the generation, transmission, processing, display of information, or guidance provided to aircraft and/or air traffic personnel. This paragraph shall refer to the latest edition of FAA Order 8020.11, Aircraft Accident and Incident Notification, Investigation, and Reporting, for the general requirements following an aircraft accident/incident. In addition, this paragraph shall include requirements that are unique to the particular facility, system, or equipment. For example, the handbook on very-high-frequency omnidirectional range (VOR) facilities should contain a statement concerning ground checks following an aircraft accident/incident. The general information contained in Order 8020.11 may be supplemented as needed, but the general information should not be repeated in this paragraph.

d. Chapter 2. Technical Characteristics. This chapter shall be made a part of each handbook. It shall contain information needed to acquaint the reader with the system or equipment with which the handbook is concerned. The chapter shall include the topics described in the subparagraphs below, but need not be organized to employ the exact subparagraph titles shown.

(1) Purpose or Function. The discussion shall contain information relating to the purpose or function of the system or equipment and, when applicable, how the system or equipment is used in conjunction with other systems or equipment. Two examples of typical introductory statements follow:

(a) Precision approach radar provides aircraft position information to the airport traffic controller for use in advising pilots flying under instrument flight rules (IFR).

(b) The communications system provides communication links between the aircraft pilot and the air traffic controller.

(2) Description. The discussion shall include a general physical and technical description of the equipment or system as applicable. Where good judgment indicates that various models or configurations of equipment should be described, such information shall be shown for each type of equipment or configuration.

(3) Theory. The discussion shall include sufficient theory of operations of the system or equipment to provide a comprehensive understanding of functions. Detailed equipment theory, similar to that normally given in training manuals and instruction books, shall not be included except in special instances where it is essential for understanding the operation and maintenance of the equipment. References to the instruction book theory shall be provided when applicable. Functional block diagrams shall be included when the operation can best be explained by their use. Abstract theory is not to be included unless justified by a definite requirement.

e. Chapter 3. Standards and Tolerances. This chapter shall be made a part of each handbook. It shall provide a list of the essential system or equipment parameters, the standard value assigned to each parameter, and the initial and operating tolerances/limits imposed on each standard.

(1) Content.

(a) The standards, initial tolerances/limits, and operating tolerances/limits specified in maintenance technical handbooks shall be as follows:

1. The STANDARD shall be the optimum value assigned to an essential parameter of the system and shall be compatible with the system as a whole and the design capability of the equipment involved. Often, this will be the FAA Form 6030-17, Technical Data Record, value established at facility commissioning.

2. The INITIAL TOLERANCE/LIMIT shall be the maximum deviation from the standard value of the parameter, or the range, which is permissible when the system or equipment is accepted for use in the NAS at the time of initial commissioning or after any readjustment, modification, or modernization.

3. The OPERATING TOLERANCE/LIMIT shall be the maximum deviation from the standard value of the parameter or the range within which a system or an equipment may continue to operate on a commissioned basis without adjustment or corrective maintenance and beyond which remedial action by maintenance personnel is mandatory.

(b) The standards and tolerances/limits prescribed in maintenance technical handbooks shall be based on system and monitor requirements, specifications under which the equipment was manufactured, use of standard test equipment, standard procedures, and the results of field experience. System and monitor standards and tolerances/limits shall be applicable to the system taken as a whole.

(c) Where monitor alarm equipment is employed, the equipment operating standards and tolerances/limits and the monitor alarm standards and tolerances/limits will seldom be the same. Equipment operating standards and tolerances/limits should be considered to be quality-control type requirements, beyond which a deviation will not ordinarily endanger a user. Monitor alarm standards and tolerances/limits, however, should be considered to be the limits beyond which safety may be jeopardized. Also, monitor alarm standards and tolerances/limits should indicate whether the monitor alarm tolerances are greater than or less than the operating tolerances for certification.

(2) Presentation. Insofar as practical, the standards and tolerances shall be listed in tabular form, cross-referenced as appropriate to the paragraph which describes the procedure for checking each of the required parameters. This cross-reference will be in Chapter 5, Maintenance Procedures, or the equipment instruction book. If the nature of the standards and tolerances is such that they do not lend themselves to tabulation, paragraph presentation may be employed. See Figure 2-1 and Figure 2-1A, Performance Parameters/Inspection Elements.

(3) Paragraphing.

(a) The first paragraph of this chapter shall be titled and worded as follows:

GENERAL. This chapter prescribes the standards and tolerances for (Specify), as defined and described in the latest edition of Order 6000.15. All key performance parameters and/or key inspection elements are clearly identified by an arrow (->) placed to the left of the applicable item.

(b) The rest of the paragraphs in this chapter may be titled by facility type (e.g., Air Route Traffic Control Center (ARTCC), remote control air to ground (RCAG), etc.), by site location (e.g., transmitter/receiver site, indicator site, repeater site, etc.), by equipment model (e.g., ASR-7, ASR-8, etc.), by functional equipment grouping (e.g., transmitter, receiver, monitor, indicator, etc.), or by whatever scheme is most convenient. Numbered paragraphs and lettered/numbered subparagraphs shall be employed even where the standards and tolerances are presented in tabular form.

(4) Emphasis. Certain parameters are considered critical indicators of whether the system or equipment is performing its intended function and is being maintained properly. These key performance parameters or key inspection elements shall be clearly singled out and identified by placing an arrow (->) to the left of the item as listed in the tabulation of parameters.

f. Chapter 4. Periodic Maintenance. This chapter shall be made a part of each handbook. It shall enumerate all of the maintenance activities required on a periodic basis whether on a fixed, scheduled basis or on an irregular but nevertheless recurring basis. This enumeration is done in order to ensure top efficiency in system and equipment performance, to minimize unwanted interruption in service, and to eliminate major breakdowns. It shall stipulate the schedules for the accomplishment of these activities. The schedules shall reflect the maximum permissible intervals between successive accomplishments to ensure that the performance of the system or equipment is reliable and within designated technical tolerances or limits.

(1) Presentation. Except for the first paragraph of the chapter as described below, the chapter shall be divided into two sections (see Order 1320.1 for the approved method). The first section shall be titled PERFORMANCE CHECKS and the second section shall be titled OTHER MAINTENANCE TASKS. Both sections shall be presented in tabular form as shown in figure 2-2, figure 2-2A, figure 2-2B, figure 2-2C, figure 2-3, figure 2-3A.

(2) Content.

(a) Pursuant to Order 6000.15, this chapter shall fully delineate ALL required periodic maintenance activities. To accomplish this, each section shall employ one or more of the three techniques described below, whichever is appropriate for the individual handbook, section and/or subject. Each section shall clearly state which of the techniques is employed. The same technique need not be used in both sections. Current AOS procedure is to include instruction book periodic maintenance schedules in maintenance handbooks.

1. ALL of the required periodic maintenance activities will be listed. These activities shall be accomplished instead of those contained in the equipment instruction books. The frequency of accomplishment of each activity will be stipulated in precise terms (e.g., weekly, quarterly, etc.) or, in general terms (e.g., as required, every 3 to 4 months, etc.).

2. Other periodic maintenance activities may be prescribed to supplement those activities cited in the equipment instruction books.

3. SPECIFIC periodic maintenance activities contained in the equipment instruction books will be incorporated by specific paragraph reference, and the frequency of accomplishment of these activities will be prescribed.

(b) The section titled PERFORMANCE CHECKS shall list all tests, measurements, and observations of normal operating controls and functions necessary to determine whether a system or equipment is operating within its established tolerances or limits. Each listed activity shall first describe an action (e.g., inspect, observe, measure, etc.) and then, if not obvious, explain what the action is designed to do (i.e., what irregularity is being sought). The section shall also include cross-references as appropriate to the paragraphs in Chapter 3, Standards and Tolerances, Chapter 5, Maintenance Procedures, and/or the equipment instruction book, as shown in figure 2-2 thru figure 2-2C. Examples of PERFORMANCE CHECKS include: VOR ground checks, localizer clearance and course location measurements, programmed equipment checkout of NAS En Route Stage subsystems such as the teletypewriter subsystem, transmitter power output and modulation measurements, radar system minimum discernible signal measurements, meter reading observations and recordings, differential settlement and horizontal/vertical alignment checks in structures, etc.

(c) The section titled OTHER MAINTENANCE TASKS shall list all tasks other than those listed in section 1 which are necessary to prevent deterioration and/or to ensure reliable operation of a system or equipment. Each listed activity shall first describe an action (e.g., lubricate, change, adjust, etc.) and then, if not obvious, shall explain what the action is designed to do. The section shall also include cross-references as appropriate to the paragraphs in Chapter 3, Standards and Tolerances, Chapter 5, Maintenance Procedures, and/or the equipment instruction book. Examples of OTHER MAINTENANCE TASKS include: lubrications, engine generator oil changes, scheduled equipment overhaul, belt tension adjustments, etc.

FIGURE 2-1. PERFORMANCE PARAMETERS/INSPECTION ELEMENTS

SAMPLE

TRANSMITTER SITE EQUIPMENT (CONTINUED)					
Parameter		*Reference Paragraph*	*Standard*	*Tolerance/Limit Initial*	*Operating*
→	(5) Video output .	93c	2V	1.9V to 2.3V	1.9V to 2.3V
*→	(6) Tangential . . sensitivity	93d	Commissioning value	-87dBm	-85dBm
→	(7) Overall system sensitivity	93e	Commissioning value	Same as standard	Within 3dB of standard value * (-83dBM minimum)
	(8) Local . . . . . oscillator frequency	93i	1030.5MHz	1030.3MHz to 1030.7MHz	1030.3MHz to 1030.7MHz
	c. ATCBI-3 Pulse . . . MODE Generator.	ATCBI-3B ib, sect 4, par 3.4.1			
*→	(1) Output prf	OR ATCBI-3D ib, sect 2, par 7.2	Commissioning value	Same as standard	Same as standard *
	(2) Countdown ratio				
	(a) ARSR . . .		1:1	Same as standard	Same as standard
*	(b) ASR . . .		Commissioning value	Same as standard	Same as standard
	(3) Trigger delay (systems with radar reinforced processing)		Commissioning value	±0.5μs	±1.0μs

FIGURE 2-1A. PERFORMANCE PARAMETERS/INSPECTION ELEMENTS

SAMPLE

TRANSMITTER SITE EQUIPMENT (CONTINUED)				
Parameter	*Reference Paragraph*	*Standard*	*Tolerance/Limit Initial*	*Operating*
(4) Trigger delay (systems without radar reinforced processing)		Commissioning value	±.05µs	±1.0µs *
d. ATCBI-3 System Monitor.				
(1) Power . . . . . monitor alarm	ATCBI-3 ib, sect 6, par 4.3i, ATCBI-3B ib, sect 4, par 3.7	±1dB power change	Same as standard	Same as standard
(2) Range alarm . .	ATCBI-3 ib, sect 6, par 4.3o	±1µs timing change	Same as standard	Same as standard

FIGURE 2-2. SPECIMEN PERIODIC MAINTENANCE PERFORMANCE CHECKS TABULATION

SAMPLE

Subsection 1. ASR-4/4B/4D/4E

	Performance Checks	*Reference Paragraph*	
		Standards & Tolerances	*Maintenance Procedures*
115.	DAILY. Perform the following checks and record the required data on FAA Form 6000-8.		
	a. Transmitter power	45	165
*	b. Receiver sensitivity (minimum discernible signal-mds) . .	46 and 47	166, 167, TI 6310.22, par 6.5.1.9, 6.5.1.12, and 6.5.1.12A *
	c. Output of line drivers	61	178
116.	WEEKLY. Perform the following checks and record the required data on FAA Form 6000-8.		
	a. Transmit-receive (tr) tube recovery time	48	171
	b. Ring time	49	172
	c. Echo box cancellation ratio	51	170
	d. Transmitter spectrum	62	173
	e. Video subclutter visibility	54	176
	f. Transmitter frequency	N/A	180
	g. Standing-wave ratio	57	169
	h. System sensitivity	64	179
	i. Cancellation ratio per canceller .	53	174
	j. Receiver noise figure	52	168
117.	MONTHLY. Check echo box subclutter visibility	50	175
118.	QUARTERLY. Check antenna adjustments		
*	a. ASR-4 antenna	63	177e(1) and (2)
	b. ASR-8 antenna	63	TI 6310.22, sec 6, par 6.6.3-6.7 *

FIGURE 2-2A SPECIMEN PERIODIC MAINTENANCE PERFORMANCE CHECKS TABULATION

SAMPLE

Subsection 2. ASR-5/5D/5E/6/6D/6E

Performance Checks	*Reference Paragraph*	
	Standards & Tolerances	*Maintenance Procedures*
125. DAILY. Perform the following checks and record the required data on FAA Form 6000-8.		
a. Transmitter power	75	190
b. Receiver sensitivity (mds)	76 and 77	191 and 192
c. Output of line drivers	91	203
126. WEEKLY. Perform the following checks and record the required data on FAA Form 6000-8.		
a. Tr tube recovery time	78	196
b. Ring time	79	197
c. Echo box cancellation ratio	81	195
d. Transmitter spectrum	92	198
e. Video subclutter visibility	84	201
f. Standing-wave ratio	87	194
g. Transmitter frequency	N/A	205
h. System sensitivity	94	204
i. Receiver noise figure	82	193
j. Cancellation ratio per canceller .	83	199
127. MONTHLY. Check echo box subclutter visibility	80	200
128. QUARTERLY. Check antenna adjustments		
* a. ASR-5/6 antenna	93	202e(1) and (2)
b. ASR-8 antenna	93	TI 6310.21, chp 5, sec 1 *

FIGURE 2-2B SPECIMEN PERIODIC MAINTENANCE PERFORMANCE CHECKS TABULATION

SAMPLE

Subsection 1. ASR-7/7E/7F

Performance Checks	*Reference Paragraph*	
	Standards & Tolerances	*Maintenance Procedures*
145. TRANSMITTER SITE.		
a. Weekly. Perform the following checks and enter the required data on FAA Form 6000-8.		
(1) Transmitter power	55	175, Table 6-3
(2) Receiver sensitivity (mds) .	56	176
(3) Output of line drivers	68	Table 6-8
(4) Ring time	58	179
(5) VSWR	65	183
(6) System sensitivity	71	186
b. Biweekly. Check transmitter . . spectrum and enter the required data on FAA Form 6000-8.	69	180
c. Monthly. Perform the following checks and enter the required data on FAA Form 6000-8.		
(1) Tr limiter recovery time . .	57	178
(2) Receiver noise figure	61	222d(6)(b)
(3) Transmitter frequency . . .	N/A	Table 6-12
d. Quarterly. Check video . . . . . cancellation ratio and enter the required data on FAA Form 6000-8.	62	Table 6-7
146. INDICATOR SITE.		
a. Monthly. Perform the following checks and enter the required data on FAA Form 6000-8.		
(1) Check mti reflector . . . . . operation	81	184
(2) Check ARP amplitude.		

FIGURE 2-2C SPECIMEN PERIODIC MAINTENANCE PERFORMANCE CHECKS TABULATION

SAMPLE

Subsection 1. ASR-7/7E/7F (Continued)

Performance Checks	*Reference Paragraph*	
	Standards & Tolerances	*Maintenance Procedures*
(a) ASR-7	80a(2)	185e(1)
(b) ASR-7E and ASR-7F	80a(2)	
(3) Check ACP amplitude.		
(a) ASR-7	80b(3)	185e(1)
(b) ASR-7E and ASR-7F	80b(3)	
b. Quarterly. Perform the following checks and enter the required data on FAA Form 6000-8.		
(1) Check ARP pulse width.		
(a) ASR-7	80a(3)	185e(1)
(b) ASR-7E and ASR-7F	80a(3)	
(2) Check ACP pulse width.		
(a) ASR-7	80b(4)	185e(1)
(b) ASR-7E and ASR-7F	80b(4)	

FIGURE 2-3. COMBINED TASKS FOR ENVIRONMENTAL HANDBOOKS

SAMPLE

Maintenance Activities	*Reference Paragraph*	
	Standards & Tolerances	*Maintenance Procedures*
412. MONTHLY.		
a. Air Distribution System. . . . . Visually check all air intake and exhaust openings, screens, louvers, etc., for obstructions; remove as required.	N/A	N/A
b. Heating Water and Steam Systems. . Visually check condition of burner linkages and drive belts on belt-driven boiler auxiliary equipment; replace or tighten as required.	Instruction book	Instruction book
c. Condenser Water System.		
(1) Check cooling tower fan . . . gear reducer oil level.	304a(1)	Instruction book
(2) Check condenser pump . . . . . motor oil level in sight glass, if applicable. Lubricate pump packing box.	304e(3)	Instruction book
(3) Visually inspect fan . . . . . and drive coupling, fan clamps, and fasteners for security.	N/A	534
(4) Check cooling tower sump . . for sediment; clean if required.	N/A	534
(5) Lubricate condenser water : . pump packing box (if not self-lubricated).	Instruction book	Instruction book

NOTE: The Tabulation of Performance Checks and Maintenance Tasks may be combined in environmental handbooks. The combined listing of activities should be headed Maintenance Activities.

FIGURE 2-3A. COMBINED TASKS FOR ENVIRONMENTAL HANDBOOKS

SAMPLE

Maintenance Activities	*Reference Paragraph*	
	Standards & Tolerances	*Maintenance Procedures*
* 413. QUARTERLY.		
a. Air Distribution System.		
(1) Check blower bearings and . . lubricate if required.	N/A	Instruction book
(2) Visually check condition. . . of all other air filters on exhaust fans, intake dampers, etc., not monitored by the CCMS; replace as required.	N/A	509
(3) Visually check all air- . . . handling system dampers for proper position; adjust as required.	Instruction book	Instruction book *
b. Heating Water and Steam Systems.		
(1) Check boiler ignition . . . . assemblies and electrodes for condition and proper positioning of burner and safety pilot flames; clean and adjust as required.	Instruction book	Instruction book
(2) Check oil atomizing . . . . . nozzles; clean if required.	N/A	Instruction book
(3) Clean flame detector . . . . . lens and check scanner cell.	N/A	Instruction book
(4) Check primary and . . . . . secondary air dampers; remove accumulated lint or dirt.	N/A	N/A
(5) Inspect oil strainers for . . condition; clean or replace as required	N/A	Instruction book

NOTE: The Tabulation of Performance Checks and Maintenance Tasks may be combined in environmental handbooks. The combined listing of activities should be headed Maintenance Activities.

(3) Paragraphing.

(a) The first paragraph of this chapter shall be titled and worded as follows:

GENERAL. This chapter establishes all the maintenance activities that are required for __(Specify)__ on a periodic, recurring basis, and the schedules for their accomplishment. The chapter is divided into two sections. The first identifies the performance checks (i.e., tests, measurements and observations) of normal operating controls and functions, which are necessary to determine whether operation is within established tolerances/limits. The second section identifies other tasks that are necessary to prevent deterioration and/or ensure reliable operation.

(b) The sections titled PERFORMANCE CHECKS and OTHER MAINTENANCE TASKS shall each be a tabulation or a series of tabulations listing the required periodic maintenance activities cross-referenced as indicated in figure 2-2 thru figure 2-2C. Numbered paragraphs shall be employed even though the maintenance schedules are presented in tabular form. The information shall be paragraphed in a way which will result in its being most usable and useful to the field technician at the site. Some examples of the various possibilities are presented in the following subparagraphs.

NOTE: Although the illustrations use some of the current handbook subjects, the sample tabulations do not necessarily show the actual breakdown used in the handbooks or even what might be considered desirable. These are simply possibilities.

1. If the handbook covers several facility types (e.g., Air/Ground (A/G), ARTCC, RCAG, etc.), the maintenance schedules may be identified first by individual facility type and then by functional equipment grouping as follows:

FIGURE 2-4. CHAPTER 4. TABULATION FOR SEVERAL FACILITY TYPES

Performance Check or Maintenance Task	*Reference Paragraph*	
	Standards & Tolerances	*Maintenance Procedures*
___. ARTCC.		
a. Transmitters.		
(1) Daily.		
(a) Etc.		
(2) Weekly.		
(b) Etc.		
(3) Etc.		
b. Receivers.		
(1) Etc.		
c. Etc.		
___. RCAG.		
Etc.		

2. If the handbook covers one facility type (e.g., ASR handbook), the maintenance schedules may be identified first by equipment model and then by site location and functional equipment grouping as follows:

FIGURE 2-5. CHAPTER 4. TABULATION FOR A SINGLE FACILITY TYPE MODEL, LOCATION, AND FUNCTION GROUPING)

Performance Check or Maintenance Task	*Reference Paragraph*	
	Standards & Tolerances	*Maintenance Procedures*
___. ASR-7.		
a. Transmitter/Receiver Site.		
(1) Transmitters.		
(a) Daily.		
1. Etc.		
(b) Weekly.		
1. Etc.		
(2) Receivers.		
(3) Etc.		
b. Indicator Site.		
c. Etc.		
___. ASR-7.		
Etc.		

3. If the handbook covers one facility type (e.g., Engine Generator (E/G) handbook), the maintenance schedules may be identified first by equipment type and then by size as follows:

FIGURE 2-6. CHAPTER 4. TABULATION FOR A SINGLE FACILITY TYPE (MODEL AND SIZE GROUPING)

Performance Check or Maintenance Task	*Reference Paragraph*	
	Standards & Tolerances	*Maintenance Procedures*
___. DIESEL EG. a. Below 125 KVA. (1) Monthly. (a) Etc. (2) Quarterly. (a) Etc. (3) Etc. b. 125 KVA and above. (1) Etc. ___. GASOLINE EG. Etc.		

4. If the handbook covers one facility type (e.g., the Instrument Landing System (ILS) handbook), the maintenance schedules may be identified first by functional equipment grouping and then by equipment type as follows:

FIGURE 2-7. CHAPTER 4. TABULATION FOR A SINGLE FACILITY TYPE (FUNCTION AND MODEL GROUPING)

Performance Check or Maintenance Task	*Reference Paragraph*	
	Standards & Tolerances	*Maintenance Procedures*
___. LOCALIZER.		
a. Mark 1a.		
(1) Biweekly.		
(a) Etc.		
(2) Quarterly.		
(a) Etc.		
(3) Etc.		
b. Mark 1f.		
(1) Etc.		

5. If the handbook covers one functional equipment grouping (e.g., Very High Frequency (VHF)/Ultra High Frequency (UHF) Air Ground Transmitters), the maintenance schedules may be identified just by equipment type as follows:

FIGURE 2-8. CHAPTER 4. TABULATION FOR FUNCTIONAL EQUIPMENT GROUP (TYPE OR MODEL)

Performance Check or Maintenance Task	*Reference Paragraph*	
	Standards & Tolerances	*Maintenance Procedures*
___. AN/GRT-xx.		
a. Monthly.		
(1) Etc.		
b. Quarterly.		
(1) Etc.		
c. Etc.		

6. If the handbook covers a subject in which the maintenance schedules need to be identified only by periodicity of time, the tabulation may appear as follows:

FIGURE 2-9. CHAPTER 4. TABULATION WITH TASKS IDENTIFIED BY PERIOD ONLY

Performance Check or Maintenance Task	*Reference Paragraph*	
	Standards & Tolerances	*Maintenance Procedures*
___. DAILY. a. Etc. b. Etc. ___. WEEKLY. a. Etc. b. Etc.		

7. If the handbook covers several related systems for which it is likely that the same person or crew will be performing all of the periodic maintenance at any given location, and possibly even at several locations, all of the activities may be grouped first by periodicity of time and then by system as follows:

FIGURE 2-10. CHAPTER 4. TABULATION WITH TASKS IDENTIFIED BY PERIOD AND SYSTEM

Performance Check or Maintenance Task	*Reference Paragraph*	
	Standards & Tolerances	*Maintenance Procedures*
___. QUARTERLY.		
a. Foundation Systems.		
(1) Etc.		
b. Floor Systems.		
(1) Etc.		
___. SEMIANNUALLY.		
a. Foundation Systems.		

8. If the applicable FAA Form 6000 series form contains most or all of the performance checks (or maintenance tasks) that are to be accomplished on a unit schedule, the following tabular arrangement should be used:

FIGURE 2-11. FAA FORM 6000 SERIES CORRELATION WITH PERFORMANCE CHECKS OR MAINTENANCE TASKS ON A UNIT SCHEDULE

Performance Check or Maintenance Task	*Reference Paragraph*	
	Standards & Tolerances	*Maintenance Procedures*
___. DAILY (or MONTHLY, etc.). a. Complete FAA Form 6000 series. b. Etc. (For additional items required daily (or monthly etc.) but not printed on the FAA Form 6000 series.)		

9. If the applicable FAA Form 6000 series contains checks or tasks to be performed at various intervals, these should be correlated in the tabular schedules as in the following example:

FIGURE 2-12. FAA FORM 6000 SERIES CORRELATION WITH PERFORMANCE CHECKS OR MAINTENANCE TASKS AT VARIOUS INTERVALS

Performance Check or Maintenance Task	*Reference Paragraph*	
	Standards & Tolerances	*Maintenance Procedures*
___. DAILY. a. Inspect standby equipment. (FAA Form 6000 series Item) b. Etc. ___. WEEKLY. a. Check AC ripple in DC power supplies. b. Linearity Check. (FAA Form 6000 series Item c. Etc.		

g. Chapter 5. Maintenance Procedures. This chapter shall be made a part of each handbook. It shall include the procedures which are required for accomplishing the various essential maintenance activities, both periodic and incidental, and any associated safety precautions.

(1) Presentations. Except for the first paragraph of the chapter, the chapter shall be divided into 3 sections. The first section shall be titled PERFORMANCE CHECK PROCEDURES, the second section shall be titled OTHER MAINTENANCE TASKS PROCEDURES, and the third section shall be titled SPECIAL MAINTENANCE PROCEDURES.

(2) Content. The various sections shall contain testing, measurement, adjustment, alignment, calibration, repair, troubleshooting, and for automated traffic control system performance and status monitoring, system reconfiguration, equipment maintenance procedures, and any associated safety precautions. It shall include information and instructions already detailed in equipment instruction books ONLY when they relate to overall system procedures. The instruction book shall be used as a guide for EQUIPMENT troubleshooting and adjustment of internal circuits and/or components. Where SYSTEM adjustments, standards, or tolerances are involved, handbook procedures shall be provided in detail. Where additional procedures of proven value have been developed through maintenance experience, they shall be included. Procedures pertaining only to certain models and configurations of equipment shall be identified and associated with the appropriate unit.

(a) The section titled PERFORMANCE CHECK PROCEDURES shall contain the procedures or methods for making the performance checks listed in chapter 4, section 1 of the maintenance technical handbook. The section shall also include instructions on the preparation and completion of required FAA Form 6000 series, when necessary.

(b) The section titled OTHER MAINTENANCE TASKS PROCEDURES shall contain the procedures or methods for doing the tasks listed in chapter 4, section 2, of the maintenance technical handbook.

(c) The section titled SPECIAL MAINTENANCE PROCEDURES shall contain the procedures or methods for doing special tasks, usually nonscheduled and not listed in chapter 4 of the maintenance technical handbook. This includes special adjustment, alignment, or calibration procedures.

(d) Each procedure described in the sections titled PERFORMANCE CHECK PROCEDURES and OTHER MAINTENANCE TASK PROCEDURES shall be cross-referenced to the check or task stipulated in chapter 4 of the maintenance technical handbook.

(e) The standards and tolerances shall not be repeated as part of the procedures described in chapter 5 of the maintenance technical handbooks. Appropriate cross-references to chapter 3 shall be made instead.

(3) Paragraphing.

(a) The first paragraph of this chapter shall be titled and worded as follows:

GENERAL. This chapter establishes the procedures for accomplishing the various essential maintenance activities which are required for (Specify) , on either a periodic or incidental basis. The chapter is divided into 3 sections. The first describes the procedures to be used in making the performance checks listed in chapter 4, section 1. The second section describes the procedures for doing the tasks listed in chapter 4, section 2. The third section describes the procedures for doing special tasks, usually nonscheduled and not listed in chapter 4.

(b) Each different procedure described in this chapter shall be a separately numbered paragraph. The following paragraphing scheme is suggested for fully explaining each procedure:

a. Object.

b. Discussion.

c. Test Equipment Required.

d. Conditions.

e. Detailed Procedure.

(4) FAA Form 6000 Series. Instructions for using FAA Form 6000 series (as applicable to specific equipment/systems) shall be included in the appropriate maintenance technical handbooks. These instructions shall conform to the general guidance and symbology for making entries included in Order 6000.15. A standard paragraph, as follows, shall be placed in Section 1, Performance Check Procedures, of chapter 5.

FAA Form 6000 Series Entries. Order 6000.15 contains guidance and detailed instructions for field utilization of FAA Form 6000 series, as applicable to the (equipment/system/facility). Entries shall be made in accordance with the instructions published in Order 6000.15, (except as otherwise instructed in the subparagraphs to follow). Figure 2-13 is a sample FAA Form 6000 series which shows typical entries for normal and unsatisfactory conditions that may be encountered.

FIGURE 2-13. EXAMPLE OF FAA FORM 6750-3 FOR SINGLE-FREQUENCY LOCALIZER

Technical Performance Record — Localizer Flight Inspection Data Work Sheet

Identification	Location	Date	Number
CSB	Localton	1/15/95	01 1.

Transmitter(s)	Flight Check Aircraft Number	Crew
Ulster/Wills	N58	Johns/Roe

Run Number	Facility Data: Transmitter Number	R.F. Power: Course # Carrier Watts	R.F. Power: Course # Sideband Milliwatts	R.F. Power: Clearance * # Carrier Watts	R.F. Power: Clearance * # Sideband Milliwatts	Monitor DDM: CRS Centerline DDM/Hz	Monitor DDM: CLR * Centerline DDM/Hz	Monitor DDM: CRS Width	Monitor DDM: CLR * Width	Carrier Feedline: CRS Course DDM/Hz	Carrier Feedline: CLR * Clearance DDM/Hz	Mod. %: CRS Course 90/150 Hz	Mod. %: CLR * Clearance 90/150 Hz	Flight Check Data: Course Width	Alignment	Low Clearance 90Hz	Low Clearance 150 Hz	Modulation Percent			Remarks
1	1	10	121	—	—	.001/150	—	.155	—	.001/150	—			5.4							Normal
2	1	10	100	—	—			.140						5.95		175/12	190/12				Wide Alarm
3	1	10	150	—	—			.172						4.75							Narrow Alarm
4	1	10	121	—	—									5.38							Normal
5	1	10	121	—	—										11μa left			20.1			Normal
6	1	10	121	—	—	.013/150				.014/150					13μa left						CW Course shift
7	1	10	121	—	—	.011/90				.010/90					11μa right						CW Course Shift

Notes:
* If applicable
# Dual Power and digital voltmeter readings are acceptable

FAA Form 6750-3 (12-84) Supersedes 6750-3 (3-75)

h. Chapter 6. Flight Inspection. This chapter shall be made a part of each handbook when flight inspections requiring action by maintenance personnel, are conducted on the pertinent equipment or system and the information in Order 6000.15 is inadequate. This chapter shall contain information on detailed ground procedures to be accomplished by maintenance personnel prior to, during, and after flight inspection. Appropriate references in the latest edition of handbook OA P 8200.1, United States Standard Flight Inspection Manual, may be included. The contents of this chapter, however, shall not duplicate the contents of Order 6000.15. Where required for completeness, additional information applicable only to the system or equipment covered by the maintenance technical handbook shall be included.

i. Chapter 7. Miscellaneous. This chapter may be made a part of the handbook. It shall contain topics which do not fit into any of the other chapters. If there are no miscellaneous items to be inserted, the chapter is not required.

217. PREPARATION OF MANUSCRIPT. Maintenance technical handbooks shall be prepared in accordance with the philosophy, language, terminology, and format as specified herein.

a. Philosophy. The handbook shall be directed to, and written for, the use of the individual employee concerned with the maintenance of equipment or system. The material presented must convey information from the mind of the writer to that of the reader, and the handbook will be satisfactory only if it effectively accomplishes this purpose. The writer should:

(1) Use proper descriptive titles with type or model numbers in referring to equipment rather than just type or model numbers.

(2) Use illustrative material as an integral part of the handbook to help present complicated or complex instructions. A better and clearer understanding of a subject can be obtained with the generous use of photographs, sketches, graphs, and drawings. Provide illustrations of system equipment, parts of equipment, or circuits to more fully explain equipment details or system functioning.

(3) Include statements concerning equipment adjustments which make it clear that the performance of such adjustments is to obtain the greatest possible accuracy, availability and operational safety factor. Such overall accuracy may not necessarily be obtained by making all adjustments to the exact center of a tolerance placed on a standard.

(4) Include statements concerning adjustments to compensate for component replacements which take into account that some components change their characteristics rapidly during the first few hours of use. The principle to be applied is the same as that discussed above.

(5) Specify that conditions during maintenance procedural adjustments shall duplicate as closely as practicable those experienced during normal unattended operation. For example: building thermostats shall not be readjusted; as much as possible, shields shall be kept in place; and outside doors shall be closed.

(6) Respect copyright-protected material. Include credit lines where appropriate.

(7) Illustrations. Illustrations shall be photographs, drawings, or other clear, readable sketches which can be converted to engineering drawings. Waveform illustrations may be either drawings or photographs. Illustrations shall be located near pertinent text. Illustrations shall be assigned sequential figure numbers.

(a) Photographs. Photographs shall be sharp, clear, and free from shadows or highlights which obscure fine detail. Photographs should be furnished in 8" x 11" sizes, however, smaller size photographs (2 1/4" x 2 1/4" or larger) will be acceptable if the pictures are clear and have good contrast. Negatives of photographs shall be furnished if available.

(b) Drawings. Standard Washington drawings may be included as illustrations by reference. Regional drawings shall be submitted as copy. Sketches shall be titled and assigned figure numbers.

(8) Tabulations. Tabulations shall be arranged so that horizontal lines of data are easily followed without danger of inadvertently deviating to the line above or below. Acceptable methods include dot leaders, ruling horizontal lines between each line of data, double spacing lines of data, or single spacing horizontal lines of data in groups of not over five, with double spaces or ruled horizontal lines between groups. Avoid excessive white space between columns. Tables shall be assigned sequential table numbers.

(9) Abbreviations and Symbols. When preparing maintenance technical handbooks, use the following standards for abbreviations and symbols:

(a) American National Standards (ANSI) Publications.

1. ASME Y1.1, Abbreviations for Use on Drawings and in Text.

2. ANSI/IEEE Std 268, Metric Practice.

3. ANSI Y32.2, Graphic Symbols for Electrical and Electronic Diagrams.

4. ANSI Y32.16, Reference Designations for Electrical and Electronic Parts and Equipment.

5. ANSI/IEEE 260, Standard Letter Symbols for Units of Measurement.

(b) Institute of Electrical and Electronic Engineers, IEEE 255, Letter Symbols for Semiconductor Devices.

(c) Military Standard, MIL-STD-27A, Designations for Electric Power Switchgear Devices and Industrial Control Devices.

(d) GPO Style Manual, to supplement (but not supersede) the above standards.

NOTE: Facility contractions are always capitalized. Use latest edition of FAA Order 1375.4, Standard Data Elements and Codes Facility Identification and Supplemental Standards, for the correct form of facility abbreviations in lieu of the above standards.

218. MANUSCRIPT CLEARANCE AND FINAL APPROVAL. Formal manuscript clearance and approval will be accomplished by the Operational Support Service in accordance with the procedures provided in Order 1320.1.

219.-299. RESERVED.

CHAPTER 3. PREPARATION OF EQUIPMENT MODIFICATION DIRECTIVES

SECTION 1. GENERAL

300. BACKGROUND.

a. When the standard subject numbering system for directives was adopted in 1962, there were approximately one thousand existing EEM's, PEM's, EFI's, and PFI's. By a conversion process, these were regrouped to form the basic handbooks with each EEM/PEM/EFI/PFI becoming a separate directive. The prefix AF P was used, and the sequential numbers were assigned as follows:

AF P ----- .1 = EEM
AF P ----- .2 = PFI
AF P ----- .3 = PEM
AF P ----- .4 = EFI

b. Subsequent new or revised chapters continued to carry these basic handbook numbers. However, when any of these handbooks is completely revised, or when a new one is issued, a new directive number is assigned. This consists of the appropriate four digit subject classification code plus a sequential number. The handbook number will no longer contain an AF P prefix.

c. EEM/PEM directives are classed as technical issuances. Technical issuances are described, in part, in Order 1320.1, as publications that directly concern installation, maintenance, or modification of equipment. Order 1320.1 recognizes the necessary deviations of technical issuances from the standard directive formats and issuance procedures. However, the directive standards given in Order 1320.1 will apply to preparation and issuance of EEM/PEM handbooks to the extent practicable.

d. Procedure regarding the administration of the modification program is presented in the latest edition of FAA Order 6032.1, Modifications to Ground Facilities Systems, and Equipment in the National Airspace System.

e. EFI/PFI's were used in the past to provide general system standards, tolerances, procedures, and/or installation instructions. The information they provided, if still current and of proven value, will be included in the next revision of the appropriate maintenance technical handbook.

301. RESPONSIBILITIES FOR EEM/PEM DIRECTIVES. AOS is the office of primary responsibility for these directives. All material in the EEM/PEM directives is issued over the signature of the Director, Operational Support Service. Instructions encompassing responsibilities of other offices shall be coordinated appropriately before issuance.

302. DIRECTIVE CONTROL. To ensure the numbering continuity of chapters in these orders, the chapter number control is maintained by the AOS directives management officer (DMO). Sequential change numbers are obtained by the AOS DMO and all official issuance records are maintained in The Plans and Programs Staff, AOS-10.

303. CHECKLISTING AND UPDATING TABLE OF CONTENTS. Because of the great volume, individual chapters are not shown in the agency checklisting system. The quarterly checklists show only the latest change. Material within each handbook is controlled by a table of contents. These are prepared by the NSED and are issued whenever two changes to the handbook are made, or within 6 months if only one change is made.

304. DISTRIBUTION. EEM's and PEM's are distributed in accordance with Order 1720.30. In this system, cost center codes for selected facilities in the Facilities Master File (FMF) are matched with address codes in the Airway Facilities Field Addresses File by automatic data processing to produce field address labels. These address labels are used to mail EEM's and PEM's directly to field locations.

305. MANDATORY PARAGRAPHS. To minimize the time recipients will need to find specific items of information, paragraphs within EEM's or PEM's follow the same sequence and, in some cases, standardized wording. The mandatory paragraphs are described in section 3 of this chapter.

306. INSTRUCTION BOOK CHANGES.

a. Changes to manufacturer's instruction books are usually associated with a modification to the corresponding equipment. In such cases the directions for changing the instruction book are part of a standardized EEM/PEM (see Appendix 3, Equipment Modification Chapter Format). However, if no modification is involved, the directions for changing an instruction book are made by an EEM or PEM chapter using the format as described in appendix 3.

b. Replacement pages or adhesive overlays are used for correcting instruction books. PEN-AND-INK CHANGES SHALL NOT BE SPECIFIED OR IMPLIED IN THE EEM OR PEM.

307.-311. RESERVED.

SECTION 2. WRITING EEM/PEM DIRECTIVES

312. EEM/PEM DIRECTIVES. EEM/PEM directives shall be promulgated for the purpose of issuing modifications and for maintaining a file of modifications issued for a particular subject classification of equipment. Modification chapters shall be issued:

a. When it is necessary to modify a particular type of equipment. The modification chapter shall include all necessary information to correct recorded data and the manufacturer's instruction book.

b. When it is necessary to update, correct, or add information to a manufacturer's instruction book (no equipment modification involved).

313. CHANGES TO EEM/PEM DIRECTIVES.

a. New chapters for EEM/PEM handbooks shall be self-transmitting.

b. In general, when 50 percent or more of the pages of a chapter, including attachments, must be reprinted to accommodate a change, a chapter revision shall be issued. The chapter number shall be retained and the word (REVISED) shall be typed below the chapter number. The existing chapter shall be withdrawn from the handbook by reference to the chapter number, change number and issuance date. The PURPOSE paragraph shall state why the chapter is being revised and what action is to be taken at the field level upon receipt of the revision. Also, the PURPOSE paragraph shall call attention to significant paragraph changes.

c. Page changes to a chapter may be issued when fewer than 50 percent of the pages of the chapter are to be reprinted. The changes may include replacement pages, new pages or instructions to delete existing pages.

d. Use asterisks to identify significant changes in the text of revised chapters, page changes to existing (issued) chapters and page changes to instruction books.

e. The table of contents (see Appendix 4, Sample EEM/PEM Table of Contents) shall be updated to incorporate:

(1) New Chapter Numbers (listed sequentially), Change Numbers, Dates, and Titles.

(2) Withdrawn and Revised Chapters. Listing of withdrawn chapters shall remain in the table of contents for record purposes. A parenthetical note shall be inserted as a line item immediately below the title of the withdrawn chapter; for example: (Withdrawn by CHG 108, 1/7/85). The revised chapter number, date, and chapter title shall be inserted as the next item in the table of contents following the withdrawn chapter.

(3) Change Transmittals. Change transmittals promulgating EEM/PEM page changes shall be included in the table of contents by the insertion of a parenthetical note as a line item immediately below the title of the affected chapter. Example: (Page change by CHG 71, 1/5/85).

314. NUMBER AND TITLE FOR EEM/PEM DIRECTIVES.

a. Chapters (or Changes) Issued for Existing Handbooks. A chapter (or change) to be added to an existing EEM/PEM handbook must use the existing handbook number and title.

b. New Handbooks. A new EEM/PEM handbook will contain one or more modification chapters. It shall be complete with a cover, record of changes, foreword, and table of contents. The handbook classification number shall be in accordance with the subject classification codes established in the latest edition of FAA Order 0000.1, FAA Standard Subject Classification System. The title of a new handbook will be one of the following:

(1) Electronic Equipment Modification (EEM) Handbook (followed by the facility description with the contraction in parenthesis).

(2) Plant Equipment Modification (PEM) Handbook (followed by the facility description with the contraction in parenthesis).

NOTE: Facility contractions, shall be in accordance with Order 1375.4.

315. IDENTIFICATION NUMBERS AND CHAPTER TITLES. Four numbers may be used to identify a modification. These are: the handbook number, the change number, the chapter number, and the equipment type number. The first three are mandatory and the last is used as appropriate.

a. Chapter Number and Change Number. The modification chapter number will be assigned by the AOS DMO after final approval. Change numbers are assigned by the Office of Information Technology (AIT) and will be obtained by the DMO in The Plans and Programs Staff, AOS-10 after the directive is approved. The handbook number, chapter number, change number, and a date of signature are typed on each page of the directive.

b. Equipment Type Number. When applicable, the equipment type designation (CA or FA type number, or contract number) shall be shown in the chapter title.

c. Chapter Title. Chapter titles are assigned by the originators. Titles shall be brief but descriptive of the modification involved. Indicate the facility or equipment type in the title. DO NOT USE the word MODIFICATION in the title.

316. TEXT.

a. Equipment Modification Chapters. Appendix 3 shows the 21 mandatory paragraph numbers and titles which shall be used to prepare the text of an equipment modification chapter. Additionally, it contains information relative to the type of material to be included in each paragraph. Instances will occur in which some of the standard paragraph titles are not applicable. In these instances the notation NOT APPLICABLE shall be used.

b. Instruction Book Modification Chapters. Paragraph 321 discusses seven mandatory paragraphs that shall be used in a modification chapter transmitting instruction book page changes, but the titles of additional paragraphs may be chosen at the discretion of the writer. The seven mandatory paragraph titles for modification chapters that authorize changes to instruction books are contained in appendix 3. The title of the chapter shall indicate that the change is to instruction book(s) of designated equipment. As needed, the chapter shall provide replacement pages, new pages, or overlays. When errors or omissions in the equipment instruction book are to be corrected by the contractor, use the guidelines presented in Appendix 5, Contractor-Revised Instruction Book Manuscript Pages for FAA Use, for obtaining the revised manuscript and artwork.

c. Modification Chapters for Contractor-Developed Equipment Modifications.

(1) Contractor-developed modifications to equipment that has been delivered (or partially delivered) to FAA shall be authorized by EEM or PEM chapters only. To obtain the necessary data for modification chapters and to effect proper coordination, program managers shall ensure that the following are included in contracts for modifications to be developed and/or performed by the contractor:

(a) A requirement for modification instructions and related information for use in writing the EEM/PEM (see Appendix 6, Contractor-Developed Modification Instructions for FAA Use). The proposed modification instructions shall be submitted by the contractor to the program manager for review and approval. Submissions must comply with all requirements of this chapter. The program manager shall advise the contractor and FAA contracting officer of approval (or rejection with comments) within 10 working days after receipt of the modification instructions.

(b) A requirement for revised instruction book manuscript pages (or camera-ready copy) and revised artwork (see appendix 5) that reflect the configuration of the equipment after modification. This material will be printed by the Government and attached to the EEM/PEM for insertion into the equipment instruction books. Submission, review, and approval of the material shall be effected in the same manner as indicated in paragraph 316c(1)(a).

(c) Instructions for shipment of modification kits.

(d) Instructions for coordination with agency elements for onsite work or return of equipment to the factory.

(2) After approving the modification instructions and instruction book page change material furnished by the contractor, the NSED uses this information to prepare and issue a modification chapter. Appendix 6 lists the information required from the contractor in the mandatory paragraphs used in EEM's or PEM's for contractor-developed modifications.

317.-319. RESERVED.

SECTION 3. MANDATORY PARAGRAPHS FOR CHAPTERS

320. MANDATORY PARAGRAPHS FOR EQUIPMENT MODIFICATION CHAPTERS. The paragraph numbers and titles as shown in appendix 3 shall be used in preparing equipment modification chapters.

321. MANDATORY PARAGRAPHS FOR MODIFICATION CHAPTERS THAT AUTHORIZE CHANGES TO INSTRUCTION BOOKS. The seven mandatory paragraph titles for modifications chapters that authorize changes to instruction books are contained in appendix 3. The APPLICATION paragraph shall reference the applicable instruction book(s) and specify what revisions are to be made to them. The other six mandatory paragraphs shall be in accordance with the guidance given in appendix 3. A sample format for these mandatory paragraphs is given in Appendix 7, Sample Instruction Book Modification Chapter.

322. MANDATORY PARAGRAPHS FOR CONTRACTOR-DEVELOPED EQUIPMENT MODIFICATIONS. All paragraphs listed in appendix 3 shall be used in issuance of contractor-developed modifications, i.e., modification procedures and other information from the contractor shall be incorporated into the text of the modification directive rather than used as an appendix except as noted in paragraph 328b (see appendixes 5 and 6 for information to be obtained from the contractor). Instruction book page changes shall be attached to the EEM or PEM so that all offices concerned (not just field locations) will receive the corrections. When this isn't practical, indicate under the CHANGES to INSTRUCTION BOOKS

paragraphs where the corrections can be obtained. If it is necessary for the equipment to be returned to the factory for modification, include the factory address and method of shipment (normally by Government Bill of Lading) under MODIFICATION TO BE PERFORMED BY paragraph, and the date or other scheduling information for shipping under WHEN MODIFICATION IS TO BE PERFORMED paragraph.

323.-325. RESERVED.

SECTION 4. PREPARING AND ISSUING EEM/PEM DIRECTIVES

326. STANDARDS FOR ABBREVIATIONS AND SYMBOLS.

a. Standards. When preparing EEM's or PEM's, use the standards for abbreviations and symbols described in paragraph 217a(9).

b. Exceptions to Standards.

(1) When referring specifically to portions of equipment such as switches or controls, use abbreviations as labeled on the equipment. For example, if a switch on a control panel is labeled AFC, it should be referred to in the text of an EEM or PEM as AFC rather than "afc" as indicated in AMSE Y1.1 (paragraph 217a(9)).

(2) When preparing instruction book page changes or overlays as attachments to the EEM or PEM, use the same style, typography, symbology, and abbreviations as used in the existing instruction book.

327. FIRST PAGE OF A CHAPTER. The first page of a modification chapter shall be typed on FAA Form 1320-1, Order Format. The word ORDER in the upper left-hand corner shall be opaque. If it is a safety modification, the words THIS IS A SAFETY MODIFICATION in all caps should precede the text of the PURPOSE paragraph. The heading of the first page of a modification chapter shall include the following:

a. Subject. The subject shall be the title of the modification handbook. It shall be typed in all caps immediately above the solid black subject line.

b. Chapter Number and Title. The chapter number and title shall be typed as the first item below the solid black line under SUBJECT and shall be typed in all caps in the center of the page starting at the fourth vertical blue guideline. The title will be spaced down two lines.

c. Equipment Type Number. When available, the equipment type number or contract number shall be part of the chapter title.

d. Bottom of Page. Information shall be typed as indicated in appendix 3. The routing symbol of the office which prepared the modification directive shall be typed following INITIATED BY.

328. SUBSEQUENT PAGES.

a. Subsequent pages of the same modification chapter may be typed on FAA Form 1320-10, Directive Typing Guide - Odd and Even Page, or reproduced using word processing systems. The handbook number, change (CHG) number, and date shall be typed at the top of each page in the spaces provided. The page number, the number of the paragraph that continues or begins at the top of the page, and the modification chapter number shall be typed at the bottom of each page in the spaces provided. The signature block should appear at the left margin. Type the director's name and title in the same manner as for correspondence except the routing symbol AOS-1 should NOT appear.

b. Appendixes.

(1) Appendixes to the modification chapter shall include such things as lengthy modification procedures, figures, or drawings pertinent to the performance of the modification chapter. Number and title figures (except tables) shall be at the bottom of the figure. Tables should be numbered and titled at the top of the table. The word APPENDIX or the number and APPENDIXES (e.g., 2 appendixes) whichever is applicable, shall be typed two lines below the signature on the approval page of the modification chapter.

(2) Append lengthy modification procedures (ten pages or more of text) to the modification chapter rather than incorporating the procedures into the main body of the modification chapter. Similarly, include TEST AFTER MODIFICATION as a separate appendix, if it is ten pages or more of text. Use the same basic text format as described in Order 1320.1, for paragraphing, numbering, and indentation. Use the words MODIFICATION PROCEDURE and TEST AFTER MODIFICATION for the titles of these appendixes. Reference the appended material in paragraph 14 and/or 15 of the modification chapter.

c. Attachments to the modification chapter shall include new pages, replacement pages, or overlays, for the instruction book revision. Attachments to the EEM/PEM shall follow the appendixes. Each page of the instruction book revision shall be annotated with the handbook number, change number, chapter number and date (at the top left-hand corner for even pages and top right-hand corner for odd pages). Each page shall also bear the manufacturer's instruction book page number. See the sample replacement page in Appendix 8, Sample Instruction Book Replacement Page. The words ATTACHMENTS (INSTRUCTION BOOK CHANGES) shall be typed four lines below the signature on the approval page of the EEM/PEM.

d. Overlays.

(1) Gummed or adhesive-backed overlays may be used for making minor instruction book page corrections. Overlays are more economical to prepare and print than replacement pages when correction to several pages can be grouped on a common sheet. Overlays should be less then one-half of an 8 1/2" x 11" page size, should not cover fold-in, fold-out charts, and should be easy to apply and align without error.

(2) Prepare the camera-ready copy for overlays on 8 1/2" x 11" white paper. Draw overlay sections in black ink. Draw a dashed line border around each section to serve as a guide for cutting. Include enough cutout overlay sections to annotate each instruction book page corrected with the directive number, change number, chapter number, and directive issuance date. Identify each overlay section with an alphanumeric symbol at the bottom of the section (outside the border) so that the section can be referenced in the CHANGES TO INSTRUCTION BOOKS paragraph. Identify each 8 1/2" x 11" overlay sheet at the top with the instruction book title, (e.g., Overlays for ASR-8 Troubleshooting Manual, Volume 1). In addition, type the directive number, change number, chapter number, and issuance date at the top right-hand corner of each overlay sheet.

(3) Overlay sheets should not be paginated but included as the last attachment to the modification chapter. The sheets should be printed on adhesive-backed paper.

(4) Provide instructions in the CHANGES TO INSTRUCTION BOOKS paragraph of the modification chapter for applying the overlays. Refer to each overlay section by alphanumeric symbol, and indicate the page to which it applies along with any special positioning instructions.

329. PAGE LAYOUTS FOR PAGE CHANGES TO EXISTING (ISSUED) CHAPTERS. Page changes may be prepared on FAA Form 1320-10, Directives Typing Guide - Odd and Even Page, and transmitted with FAA Form 1320-4, Changes Format. If the first page or the APPROVAL page is changed, a phrase such as: Page revised 3/2/85 by CHG 7, is to be added under the identification number for the first page or below the signature element for the APPROVAL page. The original date and change number of the first page or the APPROVAL page shall not be changed.

330. PRINTING INSTRUCTIONS. Provide special instructions on the printing request for safety modification chapters (see Order 1320.1, paragraph 308). Provide instruction on the printing request for the application of adhesive backing for instruction book overlays (if used). Provide instructions on punching and for special page size (if required) for instruction book revision pages. The punching for the modification chapters shall be 3-holes, three-eighths of an inch in diameter, four and one-quarter inch center-to-center and positioned left.

331. REPRINTING EEM/PEM DIRECTIVES.

a. When to Reprint. When the existing stock of an EEM/PEM chapter is low or exhausted, the chapter shall be reprinted if:

(1) The associated facility or equipment is still in use in the NAS and will not be phased out during the year (even though the particular modification directive is several years old).

(2) Revision of the EEM/PEM directive is not anticipated within 90 days.

b. Numbers. The following guidelines should be used in determining how many copies of an EEM/PEM to reprint.

(1) As a minimum, reprint 100 copies for expected low consumption (directives). If the directive is especially bulky, and consumption is expected to be low, reprint 50 copies.

(2) If consumption of the directive is expected to be moderate (directives less than five years old), reprint at least 200 copies, depending upon expected demand.

c. Printer's Material. For reprinting EEM/PEM directives in numbers of 500 or fewer, use camera-ready copy (typed originals and artwork), if available. If camera-ready copy is not available, furnish a printed copy of the directive for material 8 1/2" x 11". For reprinting 500 or more copies of a directive, furnish all negatives if available.

332. CHANGE TRANSMITTALS. Use FAA Form 1320-4 for transmitting page changes to EEM/PEM chapters. The change transmittal shall be prepared in accordance with Order 1320.1.

333.-399. RESERVED.

APPENDIX 1. DOT/FAA FORMS LISTING

The following DOT/FAA Forms are referenced in this order.

Form #	Title	NSN	Unit of Issue
FAA 1320-1	Order Format	0052-00-516-6003	SH
FAA 1320-2	Order Cover Format	0052-00-655-9004	SH
FAA 1320-4	Change Format	0052-00-565-0003	SH
FAA 1320-5	Record of Changes	0052-00-629-5002	SH
FAA 1320-10	Directive Typing Guide - Odd and Even Page	0052-00-516-7002	SH
AF 1720-1	Distribution Code Sheet		
FAA 6000-8	Technical Performance Record	0052-00-686-0001	PD
FAA 6030-1	Facility Maintenance Log	0052-00-028-5001	PD
FAA 6030-16	Technical Reference Data Records Cover/Transmittal Sheet	0052-00-895-3001	SH
FAA 6030-17	Technical Reference Data Record	0052-00-895-4000	SH
FAA 6750-3	Localizer Flight Inspection Data Work Sheet	0052-00-844-6000	SH

APPENDIX 2. SAMPLE NOTICE OF INTENT TO PUBLISH A MAJOR HANDBOOK REVISION

Cancellation
Date:

SUBJ: SCHEDULED REVISION OF ORDER 6000., MAINTENANCE EQUIPMENT HANDBOOK

1. PURPOSE. This notice advises regional Airway Facilities divisions, Airway Facilities field offices, and other selected offices of the intent to publish a major revision of the subject handbook. Information is solicited for use in preparation of the revision.

2. DISTRIBUTION. Indicate to whom this notice is to be distributed, (i.e., the organizational elements and level of interest). Include regional Airway Facilities divisions and all Airway Facilities field offices in the distribution.

3. ACTION.

a. The recipients of this notice who are concerned with the equipment operation, maintenance, or training are requested to furnish, from their own activities or other sources, their recommendations to be used in the revision of the subject handbook. Actual field experience factors should be cited when recommending changes to existing standards, tolerances, key inspection elements, daily performance check requirements (FAA Form 6000 series), maintenance schedules, and procedures. Recommendations should be stated in specific terms. However, it is unnecessary to submit recommendations in the exact handbook format as this will be accomplished during the revision process.

b. Airway Facilities sector offices should arrange to obtain handbook recommendations and submit them to the regional Airway Facilities division by (insert a date at least 45 days after the expected distribution of the notice).

c. Regional Airway Facilities divisions and other offices not included in paragraph 3b should collect, consolidate, and provide inputs to AOS-200/300/400/500 by (insert a date 30 days after the date specified in paragraph 3b).

d. Our goal is to distribute the revised handbook during the ____quarter, FY-__. Recommendations submitted to the Operational Support Service later than (insert the date specified in paragraph 3c) may be held for future revisions.

4. BACKGROUND. Explain in sufficient detail the need for the revision or new handbook. Cite obsolescence of material, need to convert interim pages to permanent pages, etc.

Director, Operational Support Service

Distribution: (Insert the appropriate organization and level interest codes)

Initiated By: (Preparing Office)

APPENDIX 3. EQUIPMENT MODIFICATION CHAPTER FORMAT

1. PURPOSE. This paragraph shall state briefly what will be accomplished by the modification. If the chapter is being reissued as a revision, state why and what action is expected at the field level upon receipt of the revision, (e.g., whether the modification is still pending, and whether it still requires the requisitioning of material). If the chapter is a safety modification, the words THIS IS A SAFETY MODIFICATION precede the text of the PURPOSE paragraph.

2. DISTRIBUTION. Normally, the following standard wording will be used for this paragraph: This directive is distributed to selected offices and services within Washington headquarters, regional Airway Facilities divisions, the FAA Technical Center, the Mike Monroney Aeronautical Center, and Airway Facilities field offices having _____ (specify the equipment or facilities exactly as checked on AF Form 1720-1, Distribution Code Sheet, used for retrieval of addresses).

3. WITHDRAWALS. If this modification chapter withdraws one or more modification chapters, it shall be stated in this paragraph. Withdrawals are to be in specific terms. Example: AF P 6790.1, change 91, chapter 103, dated _____ is withdrawn.

4. REFERENCES. This paragraph shall list the wiring diagrams, interunit wiring drawings, schematic diagrams, sketches, instruction books, and technical directives necessary in the performance of the modification. If a NAS change proposal/configuration control decision (NCP/CCD) number is assigned, it shall be referenced.

5. BACKGROUND. This paragraph shall state WHY the modification is required and the difficulties being encountered that will be corrected by the modification.

6. APPLICATION. This paragraph shall state on what equipment the modification is to be made. If the modification is not applicable to all equipment of a specific type, those that are to be modified shall be identified by serial number, location, or by some other means. Include a statement for special cases such as military-owned FAA-maintained equipment AS-FAILED, or optional modifications. Implementation of these modifications must be approved by the CCD process.

7. MATERIALS REQUIRED.

a. This paragraph shall list and describe all of the materials required to complete the modification for a specified unit of equipment.

b. List national stock numbers (NSN) for modification kits stocked in the FAA Logistics Center. In addition, for each part itemized (other than common hardware items; nuts, bolts, etc.), show manufacturer's part number, drawing number, or other appropriate identification such that, if necessary, the parts can be obtained separately. The Mike Monroney Aeronautical Center will provide NSN for all items identified as stock items. Stock numbers will not be provided for fabricated brackets, wire, and miscellaneous hardware.

8. SOURCE OF MATERIALS.

a. The necessary materials are normally provided as modification kits from the FAA Logistics Center. This paragraph shall state the source of material; for example:

(1) Requisition material from the Supply Management Division, AML-600.

(2) Material will be supplied by the equipment manufacturer.

b. If the modification involves field requisition of kits from the FAA Logistics Center, state the following:

KITS SHALL BE ORDERED AND USED ONLY FOR MODIFYING THE EQUIPMENT STATED IN PARAGRAPH 6 OF THIS CHAPTER. Do not order extra kits to ensure a plentiful supply of parts. However, if after receipt of the kits it becomes necessary to obtain certain parts, order the parts separately.

c. The particular NSED that prepares the modification directive shall ensure that the printed directive will not be distributed to the field until the associated modification kits are available.

9. SPECIAL TOOLS AND TEST EQUIPMENT REQUIRED. This paragraph shall state what tools and test equipment, not normally available at the equipment site, will be required for making the modification and for the subsequent tune-up or adjustment. Any tools required that are not Schedule A will be provided in the kit or itemized for regional purchase.

10. MODIFICATION TO BE PERFORMED BY. This paragraph shall state FIELD MAINTENANCE PERSONNEL OR AS DETERMINED BY THE REGIONAL AIRWAY FACILITIES DIVISION (or other source, as applicable).

11. WHEN MODIFICATION IS TO BE PERFORMED. This paragraph shall provide a modification implementation date based on the urgency of the modification, if applicable. Normally, this will be within 6 months. Consideration shall be given to coordinating an implementation date to minimize the cost of flight inspection, if required. The implementation date for safety modifications shall be within three regular working days after receipt of modification instructions and materials.

12. ESTIMATED TIME REQUIRED. This paragraph shall state the number of employees and the estimated average number of employee-hours required to perform the modification.

13. DISPOSITION OF SURPLUS PARTS. This paragraph shall state what disposition is to be made of the materials that become surplus as a result of the modification. FAA Logistics Center approval is required before directing that material be returned to the FAA Logistics Center.

14. MODIFICATION PROCEDURE. This paragraph shall provide clear, detailed instructions for making the modification. This includes whether the equipment is to be removed from its mounting, what parts are to be removed, and what parts are to be added. If possible, when parts are being added, the exact location of these parts shall be given, and if mounting holes are required, the exact location of these holes shall be indicated. If applicable, cautionary measures shall be stated. For appending modification procedures, see paragraph 328b of this order.

15. TEST AFTER MODIFICATION. This paragraph shall state the visual, mechanical, and electrical tests required to determine that the modification performs as intended. For appending test procedures, see paragraph 328b of this order.

16. RESULT OF MODIFICATION. This paragraph shall briefly describe what electrical, mechanical, or operating changes have taken place as a result of the modification. If needed, it shall contain instructions for furnishing Air Traffic personnel special information on changes in equipment operating characteristics.

17. CHANGES TO INSTRUCTION BOOKS. This paragraph shall indicate the changes to be made to particular sections (theory, operation, periodic maintenance, corrective maintenance, part lists, schematic diagrams, etc.) of the instruction book. Each page changed shall be annotated to show the directive number, date, and chapter number that transmits the change, provides replacement pages, or overlays. A page control chart should be used if new or replacement pages are involved. See appendix 6 for contractor-prepared changes to instruction book manuscripts.

18. CHANGES TO INSTALLATION DRAWINGS. This paragraph shall indicate the changes to be made to the facility installation drawings. If new diagrams, drawings, or partial overlays for existing diagrams or drawings are furnished, they shall be indicated in this paragraph. Each diagram or drawing correction shall be annotated to show the directive number, date, and chapter number that transmits the change.

19. CHANGES TO RECORDED DATA. This paragraph shall indicate the data that are to be altered or recorded as a result of the modification. Each record that is changed shall be annotated to show the directive number, date, and chapter number which directs the change. This paragraph shall also be used to call attention to the requirement for preparing FAA Form 6032-1, Airway Facilities Modification Record.

20. CHANGES TO TABLE OF CONTENTS.

a. This paragraph shall be used to indicate the updating of the table of contents for the modification handbook. If revised pages for the table of contents are attached, this paragraph shall so state. If not, this paragraph shall state that the table of contents will be updated at a later date.

b. The table of contents shall be updated whenever two changes to the handbook are made or within six months if only one change is made. If no changes are issued, do not change the table of contents.

21. RECOMMENDATIONS FOR CHANGES. This paragraph shall state the following:

Forward any recommendations for changes to this directive through normal channels to the (insert appropriate AOS NSED and routing symbol).

22. ADDITIONAL PARAGRAPHS. Additional paragraph numbers and titles may be used when warranted. For example, a paragraph entitled SOFTWARE IMPACT may be needed if the hardware modifications affect software and necessitate changes in operational or maintenance programs. An additional paragraph entitled PREREQUISITES may be needed which would describe any required baseline condition or configurations or documentation prerequisites.

APPENDIX 4. SAMPLE EEM/PEM TABLE OF CONTENTS

TABLE OF CONTENTS

APPENDIX 5. CONTRACTOR-REVISED INSTRUCTION BOOK MANUSCRIPT PAGES FOR FAA USE

1. CONTRACTOR REVISED INSTRUCTIONS. Updating of equipment instruction books shall be accomplished by page replacement when errors or omissions are found in the instruction books or when the field implementation of a contractor-developed modification results in a new equipment configuration. These page replacements shall be printed by the Government from contractor-revised manuscript pages and artwork and attached to the EEM or PEM chapters for issuance to holders of the instruction books. Contractor-revised manuscript pages and artwork shall be prepared in accordance with the following:

a. Prepare revised manuscript pages (or camera-ready copy) and artwork in accordance with the specification covering the original instruction book. Ensure that all pages of the instruction book that are affected are revised.

b. Make corrections specific and clear, using the same writing style, symbology, and abbreviations used in the original instruction book. Set off changed text data with asterisks in the margins.

c. Provide revised originals of artwork. If the original artwork for the instruction book was submitted previously to FAA for printing and is still available in FAA, this material shall be furnished to the contractor for revision.

d. Provide a cover sheet for the revised material stating the purpose of the change and the instruction book to which it applies. On the cover sheet include a page control chart showing each page to be replaced and whether it supersedes an earlier change.

APPENDIX 6. CONTRACTOR-DEVELOPED MODIFICATION INSTRUCTIONS FOR FAA USE

1. CONTRACTOR DEVELOPED INSTRUCTIONS. The following instructions are for use by the contractor in furnishing technical details of an equipment modification to FAA for inclusion in an electronic equipment modification (EEM) or plant equipment modification (PEM) chapter:

a. Purpose. State briefly what will be accomplished by the modification.

b. References. List the instruction books, drawings, sketches, or other technical documentation necessary to perform the modification.

c. Application. Indicate name, specific type designation (if any), contract number(s), and serial numbers of equipment to which the modification applies.

d. Materials Required. Itemize all of the materials required to perform the modification for a specified unit of equipment. Include quantity of each, description, manufacturer's part number, and national stock number (if applicable).

e. Tools and Test Equipment Required. List all of the tools and test equipment necessary to perform the modification and subsequent tune-up or adjustment.

f. Estimated Time Required. State the average employee-hours and number of employees required to perform the modification.

g. Modification Procedure. Provide step-by-step procedures, using sufficient detail to ensure clear instructions for making the modification. Provide separate sketches, photographs, charts, or other illustrations as necessary to aid in the performance of the modification. When parts are added, the exact location of these parts shall be given and if mounting holes are required, the exact location of the holes shall be indicated. If applicable, state any cautionary measures.

h. Test After Modification. State the visual, mechanical, and electrical tests required to determine that the modification performs as intended.

i. Result of Modification. Briefly describe what electrical, mechanical, operating, or maintenance requirement changes have taken place as a result of the modification.

APPENDIX 7. SAMPLE INSTRUCTION BOOK MODIFICATION CHAPTER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

6340.14 CHG 42

SAMPLE

11/12/92

SUBJ: RADAR FACILITIES AND EQUIPMENT MODIFICATION HANDBOOK - AIR ROUTE SURVEILLANCE RADAR, ARSR-3

CHAPTER 35. CHANGES TO ARSR-3 INSTRUCTION BOOK TI 6340.8, REPLACEMENT OF ANTENNA ROTARY JOINT

1. PURPOSE. This directive transmits instruction book pages to provide a procedure to replace the antenna rotary joint.

2. DISTRIBUTION. This directive is distributed to selected offices and services within Washington headquarters, the FAA Technical Center, the Mike Monroney Aeronautical Center, regional Airway Facilities divisions, and Airway Facilities field offices having the following facility equipment: ARSR-3.

3. WITHDRAWALS. None

4. APPLICATION. The revised pages apply to Instruction Book TI 6340.8, ARSR-3 System, Type FA-9200, Part II, Radar Electronics Subsystem, Sections 4, 5, 6, Volume 6, Contract FA75WA-3641.

PAGE CONTROL CHART

Remove Pages	Dated	Insert Pages	Dated
TI 6340.8, Part II Sections 4, 5, 6, Volume 6			
ix and x	Undated	ix	Undated
		x	11/12/92
6-307 thru 6-310	Undated	6-307 thru 6-3100	11/12/92

5. CHANGES TO RECORDED DATA. Enter this directive number, date, and chapter number on the FAA Form 6032-1, Airway Facilities Modification Record.

6. CHANGES TO TABLE OF CONTENTS. This chapter will be included in the next revision to the table of contents for Order 6340.14.

7. RECOMMENDATIONS FOR CHANGES. Forward any recommendations for changes to this directive through normal channels to the National Airway Systems Engineering Division, AOS-200, Operational Support Service.

Charles L. Stith
Director, Operational Support Service

Attachments (Instruction Book Changes)

Distribution: Selected Airway Facilities Field and Regional Offices, ZAF-605

Initiated By: AOS-220

APPENDIX 8. SAMPLE INSTRUCTION BOOK REPLACEMENT PAGE

SAMPLE

AF P 6200.1 CHG 31
Chap 56 3/10/75

FA-5662

TONE RECEIVER TEST SET

SECTION 1. GENERAL DESCRIPTION

1. GENERAL. - The Tone Receiver Test Set, Type, FA-5662, is a solid-state equipment which provides six keyed tone signals either one at a time or simultaneously. Five of the six tones employ on-off keying while the sixth is a frequency shift tone.

2. PHYSICAL CHARACTERISTICS. - The Tone Receiver Test Set is housed in an aluminum case with a removable cover as shown in Figure 1. The overall dimensions, with cover, are 12 3/4" wide by 10 5/8" high by 8" deep. All operating controls and external connections are located on the front panel, thus eliminating the need to remove the equipment from the case except for servicing.

2.1. Circuit locations. - With the exception of the front panel controls and the larger power supply components, all circuits are located on printed circuit boards. The power supply transformer, filter capacitors, and voltage regulating transistors are mounted directly on the equipment chassis as shown in Figure 16. The printed circuit boards are supported by the three-sided aluminum housing and each board is plugged into a receptacle which is attached to the chassis. This arrangement permits easy removal for substitution or for servicing purposes.

3. ELECTRICAL CHARACTERISTICS. - The assigned frequencies of the five on-off tones are 595 CPS, 935 CPS, 1275 CPS, 1615 CPS, and 1955 CPS. The center frequency of the frequency shift tone is 2805 CPS. The key-up or space frequency is 2847.5 CPS and the key-down or mark frequency is 2762.5 CPS. The * assigned frequencies can be adjusted to other carrier frequencies if desired. Also tones not available from the oscillators may be introduced to the test set via J507, EXT.AUDIO INPUT, from an audio oscillator. The purpose is to enable maintenance personnel to use the test set with VOR/VORTAC voice frequency signaling systems for example. In addition, * the amount of frequency shift (i.e., from narrow band to wide band) can also be varied depending upon the application.

3.1. Keying. - The tone signals may by keyed by any one of four modes; (1) continuous, (2) momentary, (3) dial and (4) repetitive. In addition, the dial and repetitive keying can be biased up to 50 percent mark or space distortion.

3.2. Output. - The output circuit has been designed to operate either balanced or unbalanced into a 600 ohm load impedance.

APPENDIX 9. LIST OF RELATED PUBLICATIONS

The latest editions of the following publications provide guidance to Airway Facilities personnel for use in the performance of their maintenance technical duties. These documents have been distributed to sector level and should be available there for general reference and use.

1. FAA Order 0000.1, FAA Standard Subject Classification System.
2. FAA Order 1320.1, FAA Directives System.
3. FAA Order 1320.37, Contractor Developed Equipment Instruction Books.
4. FAA Order 1320.41, Review and Validation of Equipment Instruction Book Manuscripts.
5. FAA Order 1320.43, Aeronautical Center Responsibility for Certain 6000 Series Directives
6. FAA Order 1320.45, NAFEC Responsibilities for Certain 6000 Series Directives.
7. FAA Order 1375.4, Standard Data Elements and Codes Facility Identification and Supplemental Standards.
8. FAA Order 1720.30, Distribution of Systems Maintenance Service Technical Directives Affecting Airway Facilities.
9. FAA Order 1800.58, National Airspace Integrated Logistics Support Policy.
10. FAA Order 1800.8, National Airspace Configuration Management.
11. FAA Order 4400.59, Federal Aviation Acquisition Manual.
12. FAA Order 6000.15, General Maintenance Handbook for Airway Facilities.
13. FAA Order 6032.1, Modification to Ground Facilities, Systems, and Equipment in the National Airspace System.
14. FAA Order 8020.11, Aircraft Accident and Incident Notification, Investigating, and Reporting.
15. FAA Order OA P 8200.1, United States Standard Flight Inspection Manual.